SS. Jacob Luckenbach Update

By Rob Hughes and OSPR Staff

The coordinated oil spill response lead by the Office of Spill Prevention and Response (OSPR), the U.S. Coast Guard (USCG) and its oil removal contractor, Titan Maritime, Inc.; and other State and Federal agencies partnered in the process, have successfully removed over 100,000 gallons of heavy fuel oil from the *S.S. Jacob Luckenbach*, a freighter that sank in July, 1953.

The Luckenbach Incident (initially called the San Mateo Mystery Spill) began in late November, 2001, when oiled seabirds began washing ashore between Point Reyes and Monterey Bay.

"Early on, it was clear to Unified Command that all available technology would be needed to safely remove the oil from the Luckenbach," said OSPR Warden Nack, State On-Scene Coordinator. "California's wildlife and resources had to be protected from any additional discharges of oil from the sunken wreck."

The Coast Guard opened the federal oil spill fund to finance the Luckenbach response. By initiating a formal contract bidding process, the Coast Guard awarded a contract to Titan Maritime to remove the oil from the wreck of the Luckenbach.

Titan contracted a 400-foot logistics support barge moored at the Port of Seattle. The barge easily accommodated a crew of 40 technical personnel and the specialized equipment to support saturation diving.

"The barge we chose was set up like a floating factory," said Richard Fairbanks, president of Titan Maritime. "We had to anticipate our every need to address the challenges of safely removing oil from the hull of the Luckenbach."

In May, the barge arrived in San Francisco. Additional support and technical equipment was stowed on board. It immediately proceeded to the Luckenbach's resting place, 17 miles southwest of the Golden Gate Bridge in 175 feet of water in the Gulf of the Farallones National Marine Sanctuary (NMS).

During the travel time, outfitting and deployment of Titan's barge, a steady stream of oiled seabirds, collected by a small army of OSPR field responders and Oiled Wildlife Care Network participants, kept arriving at the San Francisco Oiled Wildlife Care and Education Center in Cordelia.

Out at sea, Titan's barge was positioned above the Luckenbach, on six anchors. The Coast Guard identified a one-mile safety zone around the barge and alerted all commercial and private vessel traffic to stay clear of the oil removal operation.

But, Mother Nature's uncooperative mood surfaced as Titan's barge became fully operational.

"The first two weeks into the operation were grim for us because of high winds and rough seas," said Fairbanks. "The severe weather broke two of the six anchor cables connected to the barge. For safety reasons, the barge had to be towed back to port."

Twenty-foot seas and 60-70 mph winds closed the Golden Gate, and the barge crew was forced to seek shelter in Drake's Bay until the sea-state allowed them to go back into the Port of San Francisco for minor repairs and supplies.

When the bad weather abated, the barge was re-anchored over the Luckenbach. Now the Titan crew was on the clock to complete its contracted task.

“Titan’s crew had lost precious operational time,” said OSPR veteran spill responder Kim McCleneghan, Planning Chief and Sr. Environmental Scientist. “The annual on-water migration of Common Murre adult birds and chicks from the Farallon Islands to Monterey Bay was projected to occur sometime in June or July.”

To address this issue, Warden Nack scheduled and rotated OSPR observers on the barge to represent the Dept. of Fish and Game. Each would be on hand to monitor the oil removal operation and the seabird situation.

Personnel from Gulf of the Farallones NMS were also monitoring the wildlife in the immediate area of the operation. They also scheduled their own representative on the barge to observe and offer suggestions concerning habitat and wildlife issues.

Titan’s crew went to work utilizing side-scan radar, a Remotely-Operated Vehicle (ROV) and dive teams and found the decayed, sunken wreck of the Luckenbach resting in three sections with the aft section partially buried in the sandy bottom.

The challenge now to Titan’s saturation dive teams was to locate the oil, frame by frame, within the hull of the Luckenbach using an intricate drill and tap process. The divers would have to endure frigid water conditions and adjust to swift undersea currents.

Each two-man dive team had to endure 28 days of breathing a mixture air and helium; and work, eat and sleep at a pressure equal to the depth of 175 feet. On the bottom, the divers worked from a diving bell carefully positioned adjacent to the sunken wreck. In the evening, both divers were transported in the diving bell topside to the barge. Each diver was then transferred to a sealed living habitat (adjusted to a depth of 175 feet) to rest, eat and sleep.

Diver data coordinates began streaming in. Technicians in the barge’s command center produced an accurate three-dimensional computer-simulated image of the Luckenbach’s hull cross sections, using the coordinates relayed by the divers.

Those computer images were compared to the ship’s original construction blueprints and its 1953 shipping manifest. A clearer picture of where the oil was trapped within the wreck began to emerge.

Meanwhile, daily Unified Command meetings continued to review the progress of Titan’s oil removal operations. Onshore, wildlife search and collection teams from OSPR and OWCN continued to monitor affected beaches and collect any oiled wildlife.

Oiled seabird collections began to taper off. The employees and volunteers at the OWCN Center in Cordelia regrouped and readied themselves for the next wave of oiled wildlife arrivals.

Back on the barge, Titan research and development technicians were developing the mounting plates that would secure specially designed oil removal pumps to predetermined locations on the Luckenbach’s hull.

The design of the pumping system would also allow the passage of a steam lance (high pressure steam pipe) or a heat exchanger (a tubular, re-circulating, heating device) into the system. Each of these tools would heat the very thick oil (the consistency of peanut butter) and allow the oil removal pumps to deliver the thinner oil topside through six-inch, heavily-reinforced, hot water-injected hoses connected to large collection tanks on the barge.

In preparation, the saturation diver teams dry-practiced installing the landing plate and steam heater on a large piece of steel that simulated a hull plate section of the Luckenbach. Titan technicians made the necessary adjustments to facilitate a safe and effective installation.

Down below, the divers had systematically identified the locations of all the remaining oil in the Luckenbach. Finding and plugging broken or seriously damaged vents to double-bottoms and deep tanks, the divers' work was made more difficult by a huge amount of heavy, loose cargo.

"Unified Command now had a very clear picture of the oil removal task at hand," said Warden Nack. "But, a few key issues had to be addressed before Titan's saturation divers commenced with the oil pumping operation."

Early on, Unified Command brought NOAA's Scientific Support Coordinator on board for weather forecasting and oil trajectories in the operational area. Aerial over-flights of the region continued to be scheduled when necessary.

At issue now was the possibility of a large discharge of oil coming from the Luckenbach during the oil removal pumping operation.

Unified Command established a surface oil collection plan with local oil spill cleanup co-op, Clean Bay, Inc., and the National Response Corporation (NRC). Their oil collection assets would be placed near the barge before any oil pumping commenced. Their job was to monitor and collect any discharged oil.

Titan technicians on the barge monitored the oil removal operation from TV cameras on their saturation divers and use additional TV surveillance cameras from their roving ROVs.

Unified Command discussed the use of aerial dispersants as an emergency clean-up tool if a large discharge of oil surfaced during Titan's oil removal operation. "The discussions to use aerial dispersants in this incident were both candid and educational," said Warden Nack.

A mutual agreement and specific guidelines to use aerial dispersants in the Luckenbach's case were firmly established by all members of the Unified Command. "This is a textbook example of how the Unified Command properly establishes good working relationships with other federal state and local agencies during a spill event," said Harlan Henderson, OSPR Administrator.

Fortunately, Unified Command did not need to deploy aerial dispersants in this operation. Titan's crews managed to pump over 100,000 gallons of heavy fuel oil from the Luckenbach's hull into large collection tanks on their barge. The wreck's watery grave leaves behind an estimated 29,000 gallons of unrecoverable oil, sealed by Titan divers and entombed by surrounding sand and sediments.

"Titan started the 5-month oil removal operation on the Luckenbach in May, and the overall success of this operation could not have been achieved without the excellent coordination and trust developed between Titan and responders from the OSPR, Coast Guard, NOAA and others," concluded Fairbanks.

Titan's fully-laden barge containing all recoverable Luckenbach oil returned to the Port of Seattle for proper removal and disposal by its crew in early October.

*As of press time, the OWCN Center at Cordelia received a total of [2,179] sea birds (most of them Common Murres) in this incident. Of the 828 live birds received, [543] died and [282] were released back to habitat. [1,351] were already dead when found.
Because birds were collected far from where they were oiled, Dr. Scott Newman, spill response veterinarian with OWCN, said the rescue teams had a lower average success rate with the birds.

Unfortunately, heavy storm surges and shifting underwater currents cause some of that oil to escape. This was anticipated by the Unified Command, so the OWCN and wildlife search and collection teams have been kept on stand-by status, to be deployed following heavy weather events. There is no longer any evidence of leakage during calm weather or minor storms. Oiled seabirds continue to wash ashore after each big storm, but in smaller numbers, and for shorter periods of time.

The Luckenbach operation did not come without a price tag. The federal government, through the Coast Guard, provided more than $19 million. "The success of this oil recovery operation is the result of countless hours of hard work and the dedication of many people," said CDR Steve Boyle, USCG.

In assessing the overall response to the Luckenbach operation, Gulf of the Farallones National Marine Sanctuary Manager Ed Ueber said, "Cooperation and hard work in this incident have been an effective partnership in protecting the animals and beaches of the Gulf of the Farallones as well as resources of the state's central coast."

We hope this work will end the winter "mystery oil spills," whose regular occurrence baffled responders from the OSPR, the Coast Guard and other state and federal agencies since at least 1992.